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| BITAR, NANCY | | | | |
| ART UNIT | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/536,813

Applicant(s)

MAKRAM-EBEID, SHERIF

Examiner

NANCY BITAR

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 11 and 13 is/are rejected.
- 7) ☐ Claim(s) 4-10 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)
- Paper No(s)/Mail Date 05/27/2005
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 4,5,6,7,8,9,10, and 12 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim-. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.
2. The abstract of the disclosure is objected to because it is too long. The abstract of the disclosure should be limited to no more than 250 words. The current abstract is in excess of 300 words. Correction is required. See M.P.E.P. § 608.01(b).The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

3. The drawings are objected to because figure 4 does not comply with 37 CFR 1.84(o) where suitable descriptive legends may be used subject to approval by Office, or may be required by the examiner where necessary for understanding of the drawing. They should contain as few words as possible

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

4. Claim 13 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 13 defines "a computer program product" embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional

descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). That is, the scope of the presently claimed “a computer program product” can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on “computer-readable medium” or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 teaches "ordering the scalar valued Hermite coefficients in such a way that low-order coefficient code the coarse shape information "whereas the high order coefficients code fine details .It is unclear what element is being discussed and whether the low-order coefficient code is considered the coarse shape information and high order coefficient code is considered the fine details. Claim 3 recites the limitation "wherein the class of simultaneous transformation" in line 20. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Examiner Notes

7. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Netsch et al (Towards real time Multi-modality 3-D medical image registration, IEEE 2001) in view of Haddad et al (A new orthogonal transform of signal coding, IEEE 1988)

As to claims 1-3 , Netsch et al teaches an image processing system, for correlating shapes in multi -dimensional images (m-D), comprising image data processing means for

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estimating a similarity measure (similarity measure calculated from the grey-values of both images, paragraph 1, page 718) including computing means for: estimating two image signals ($f(x)$, $g(y)$) representing shapes defined in respective windows ($W1$, $W2$) in two multi-dimensional image (3D medical image registrations, note that the registration consists in looking for the transformation of one image that will result in the largest possible value of the sum of such "Local Correlations" over pairs of corresponding windows in the two images, see section 2.1); using a Hermite Transform (HT) applied to both said image signals (the registration transformation is determined by iteratively optimizing a similarity measure calculated from the grey values of both images, see abstract, page 718) for performing an evaluation of two first sets of scalar valued Hermite coefficients ($f_{sub.I}$, $g_{sub.I}$, $F_{sub.I}$, $G_{sub.I}$), from which a combination yields a transformed set of scalar valued Hermite coefficients [$K_{sub.I}$] (derivative of t with respect to p_l is calculated as the scalar product of image gradients with respect to x , y and z and the partial derivative of the transformation T with respect to p_l at position (x, y, z) in the 3-D image space, see section 4.2, page 721, and figure 1; applying the inverse Hermite Transform ($HT_{sup.-1}$) to the transformed set of scalar valued Hermite coefficients [$K_{sub.I}$] to achieve the computation of a windowed correlation function ($K(v)$) (the target t can be reformatted according to the inverse translation and rotation parameters r' , see paragraph 1, section 4.3, page 722); and estimating the maximum of said windowed correlation function as the wanted similarity measure to correlate the shapes (see section 2.1); and means for displaying the correlated shapes and/or processed images(see figure 2). While Netsch et al meets a number of the limitations of the claimed invention, as pointed out more fully above, Netsch et al fails to specifically teach the Hermite transformation. Specifically, Haddad et al. teaches the

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use orthogonal transform for signal coding where with the use of Hermite transformation where the MHT algorithm requires only $2N$ real multiplications or divisions for a transformation of a signal block of N samples. The MHT algorithm is also used for the inverse transformation, IMHT. The MHT algorithm makes this new transform very attractive. It is efficient computationally and comparable to the industry standard, the DCT, for the source models with positive correlation coefficients; it is somewhat better than the DCT for negative correlation coefficients (see abstract). It would have been obvious to one of ordinary skill in the art to use the Hermite transformation in registration transformation of Netsch et al. in order to help in the negative correlation thus requiring easier numerical algorithm source thus getting accurate and robust results from the images being compared and faster registration. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

Claim 11 differs from claim 1 only in that claim 1 is a method claim whereas; claim 11 is an apparatus claim. Thus, claim 11 is analyzed as previously discussed with respect to claim 1 above.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew W. Johns/
Primary Examiner, Art Unit 2624

Nancy Bitar

3/24/2008